Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims

1. (Currently Amended) A method for compensating a ~~fluid~~ thermal conductivity sensor ~~using~~ that includes a heater and a temperature sensor, wherein each of said heater and said temperature sensor are in thermal communication with ~~the~~ a fluid of interest ~~and have a resistance that changes with temperature~~, and wherein the fluid of interest includes a first component and two or more other components, the method comprising the steps of:

determining the variability range of ~~H_2O~~ at least one of the two or more other components in the fluid of interest ~~to be sensed~~;

~~selecting a desired temperature for said heater; and~~

energizing the heater with an input signal to induce an elevated temperature condition in said heater, the elevated temperature condition being such that the combined thermal conductivity of the two or more other components is less variable with concentration of the two or more other components than the individual thermal conductivities of the two or more other components; and

obtaining a measure of the thermal conductivity of the first component using said temperature sensor.

2. (Currently Amended) The method of claim 1 wherein at least one of the two or more other components includes H_2O and at least one of the two or more other components includes CO_2, the method further comprising the steps of:

determining the variability range of CO_2 in the fluid of interest ~~to be sensed~~.

3. (Currently Amended) The method of claim 1 wherein at least one of the two or more other components includes H_2O, the method further comprising the step of selecting ~~a desired~~ the elevated temperature condition for said heater by ~~further comprises the steps of~~:

measuring the thermal conductivity of the fluid of interest ~~to be sensed~~ over a range of temperatures; and

selecting ~~the desired~~ the elevated temperature based on the thermal conductivity measurements to reduce ~~minimize~~ the effect of H_2O.

4. (Currently Amended) The method of claim [[1]] 2 further comprising ~~wherein~~ the step of selecting ~~a desired~~ the elevated temperature condition for said heater by ~~further comprises the steps of~~:

measuring the thermal conductivity of the fluid of interest ~~to be sensed~~ over a range of temperatures; and

selecting ~~the desired~~ the elevated temperature based on the thermal conductivity measurements to ~~minimize~~ reduce the combined effects of H_2O and CO_2.

5. (Currently Amended) A fluid sensor for determining a selected property of one or more components in a fluid ~~fluids~~ of interest, comprising:

a heater;

a thermal sensor in proximate position to said heater and in thermal communication therewith through the ~~one or more fluids~~ fluid of interest, said sensor having a temperature dependent output; ~~and~~

energizing means connected to said heater for energizing the heater to induce an elevated temperature condition in said thermal sensor~~, wherein said elevated temperature is preselected to minimize the effect of H_2O~~;

measuring means for obtaining a measure of the selected property of at least one of the one or more components of the fluid of interest using said temperature sensor; and

wherein said elevated temperature condition is selected to reduce the effect of at least one of the components in the fluid of interest on the selected property that is measured by the measuring means.

6. (Currently Amended) The fluid sensor of claim 5 wherein at least one of the one or more components includes H20 and at least another of the one or more

components includes C02, and said elevated temperature condition is ~~also preselected~~ selected to ~~minimize~~ reduce the effect of H_20 and CO_2.

7. (Currently Amended) The fluid sensor of claim 5 wherein said fluid sensor is used to sense hydrogen concentration in the ~~one or more fluids~~ fluid of interest.

8. (Currently Amended) The fluid sensor of claim 5 wherein the ~~one or more fluids~~ fluid of interest includes ~~are gases~~ a gas.

9. (Currently Amended) A method of compensating an output a fluid sensor ~~using~~ that includes a heater and a temperature sensor, comprising:

~~adjusting the output of the fluid sensor to a known value for an ambient temperature;~~

determining the range of H_2O in the fluid to be sensed;

selecting a heater temperature to ~~minimize~~ reduce the effect of H_2O on the output of the fluid sensor; and

heating the fluid to be sensed using the heater to the selected temperature value.

10. (Currently Amended) The method of claim 9 further comprising the steps of:

determining the range of CO_2 in the fluid to be sensed; and

selecting the heater temperature value to reduce ~~minimize~~ the effect of CO_2 on the fluid sensor.

11. (Currently Amended) The method of claim 9 wherein the selected temperature is chosen to reduce ~~minimize any~~ non-linear sensor resistance values caused by the H_20 in ~~for~~ the range of H_2O concentration.

12. (Currently Amended) The method of claim 9 wherein the selected temperature is chosen to ~~minimize any~~ reduce non-linear sensor resistance values caused by the CO_2 in ~~for~~ the range of CO_2 concentration.

13. (Currently Amended) A method for compensating a ~~fluid~~ thermal conductivity sensor ~~using~~ that includes a heater and a temperature sensor, wherein each of said heater and said temperature sensor are in thermal communication with ~~the~~ a fluid of interest ~~and have a resistance that changes with temperature~~, and wherein the fluid of interest includes a first component, a second component that includes polar or non-symmetrical molecules, and a third component that includes non-polar or symmetrical molecules, the method comprising the steps of:

determining the variability range of ~~CO_2~~ the second component and/or the third component in the fluid of interest ~~to be sensed~~;

~~selecting a desired temperature for said heater; and~~

energizing the heater with an input signal to induce an elevated temperature condition in said heater, the elevated temperature condition being such that the combined thermal conductivity of the second component and the third component is less variable with concentration of the second component and the third component than the individual thermal conductivities of the second component and the third component; and

obtaining a measure of the thermal conductivity of the first component using said temperature sensor.

14. (Currently Amended) The method of claim 13 wherein at least one of the first and second components includes H_2O, the method further comprising the step of selecting ~~a desired~~ the elevated temperature condition for said heater by ~~further comprises the steps of~~:

measuring the thermal conductivity of the fluid of interest ~~to be sensed~~ over a range of temperatures; and

selecting ~~the desired~~ the elevated temperature based on the thermal conductivity measurements to ~~minimize~~ reduce the effect of ~~CO_2~~ H_2O.

15. (Currently Amended) A fluid sensor to sense hydrogen concentrations comprised of:

a thin film heater;

at least one thin film temperature sensor;

a semiconductor body with a depression therein; and

the heater and temperature sensor lying in a plane substantially parallel to the semiconductor body;

an energizer coupled to said heater, said energizer providing a control signal to said heater ~~, said heater operable~~ to induce a predetermined temperature proximate to the heater ~~and the temperature sensor inside the fluid sensor~~, said temperature being preselected to ~~minimize~~ reduce the effect of a fluid from the group consisting of H_2O.

16. (Original) The fluid sensor to sense hydrogen concentrations of claim 15 wherein said fluid sensor is operable to monitor hydrogen in a proton exchange membrane fuel cell.

17. (Original) The fluid sensor to sense hydrogen concentrations of claim 15 wherein said fluid sensor is operable to monitor the fluid mixture composition of one or more refrigerants.

18. (Currently Amended) The method of clam 1 wherein the ~~desired~~ elevated temperature condition for said heater may be configured in the field.

19. (Currently Amended) The method of claim 13 wherein the ~~desired~~ elevated temperature condition for said heater may be configured in the field.

20. (Cancel) The method of claim 1 wherein the elevated temperature condition is said heater is the desired temperature.

21. (Cancel) The method of claim 13 wherein the elevated temperature condition in said heater is the desired temperature.

22. (Currently Amended) A method for compensating an output of a fluid sensor that includes ~~using~~ a heater and a temperature sensor, comprising:

~~adjusting the output of the fluid sensor to a known value for an ambient temperature;~~

determining the range of H_2O and CO_2 in the fluid to be sensed;

energizing the heater in the fluid to be sensed to one or more temperatures and varying the amount of H_2O and CO_2 in the fluid to be sensed while monitoring the output of the fluid sensor;

selecting a heater temperature value to reduce ~~minimize~~ the effect of H_2O and CO_2 on the output of the fluid sensor;

heating the fluid to be sensed using the heater to the selected temperature value.

23. (Currently Amended) The fluid sensor of claim 8 wherein ~~its~~ the output of the sensor is used to control the concentration of individual components resulting from mixing at least two components ~~fluids~~.

24. (Cancel) The fluid sensor of claim 5 wherein the one or more fluids of interest are gases.

25. (Currently Amended) The fluid sensor of claim 5 wherein the ~~one or more fluids~~ fluid of interest includes a liquid ~~are liquids~~.

26. (Currently Amended) The fluid sensor of claim 5 wherein the ~~one or more fluids~~ fluid of interest includes a refrigerant ~~are refrigerants~~.

27. (New) A method for determining the thermal conductivity of a first component in a fluid stream, wherein the fluid stream includes the first component and two or more other components, each having a thermal conductivity, wherein an approximately relative concentration of the two or more other components is known, the method comprising the steps of:

exposing a thermal conductivity sensor to the fluid stream, wherein the thermal conductivity sensor includes a heater and a temperature sensor;

elevating the temperature of the heater to an elevated temperature where the combined thermal conductivity of the two or more other components is less variable with concentration of the two or more other components than the individual thermal conductivities of the two or more other components; and

obtaining a measure of the thermal conductivity of the first component using the temperature sensor.

28. (New) A method according to claim 27 wherein, at the elevated temperature, the combined thermal conductivity of the two or more other components is relatively constant over a range of concentrations of the two or more other components.

29. (New) A method according to claim 27 wherein, at the elevated temperature, the combined thermal conductivity of the two or more other components does not substantially affect the measure of the thermal conductivity of the first component.

30. (New) A method according to claim 29 wherein, at the elevated temperature, the thermal conductivities of the two or more other components substantially cancel each other out, so that the measure of the thermal conductivity of the first component can more easily be obtained.

31. (New) A method according to claim 27 wherein the two or more other components include a second component and a third component.

32. (New) A method according to claim 31 wherein the second component includes H_2O.

33. (New) A method according to claim 32 wherein the second component includes CO_2.

34. (New) A method for determining the thermal conductivity of a first component in a fluid stream, wherein the fluid stream includes the first component and two or more other components, each having a thermal conductivity, wherein an approximately relative concentration of the two or more other components is known, the method comprising the steps of:

exposing a thermal conductivity sensor to the fluid stream, wherein the thermal conductivity sensor includes a heater and a temperature sensor;

elevating the temperature of the heater to an elevated temperature;

obtaining a measure of the thermal conductivity of the first component using the temperature sensor; and

wherein the elevated temperature is such that the thermal conductivities of the two or more other components substantially cancel each other out so that the measure of the thermal conductivity of the first component can more easily be obtained.